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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,344	08/04/2006	Mohamed Takhim	66345-041-7	3133
25769 7590 05/25/2010 DYKEMA GOSSETT PLLC FRANKLIN SQUARE, THIRD FLOOR WEST 1300 I STREET, NW WASHINGTON, DC 20005				
EXAMINER				
QIAN, YUN				
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1793				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/583,344

**Applicant(s)**

TAKHIM, MOHAMED

**Examiner**

YUN QIAN

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☒ Claim(s) 3-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of Claims***

Claims 3-16 remain for examination. Claims 5 and 15 are amended. Claims 1-2 are canceled. Claim 16 is newly added.

### ***Previous Grounds of Rejection***

In the light of the amendment with respect to claims 2-5, 7, 9-11 and 14-15, the rejection under 35 U.S.C.103 (a) as being unpatentable over Hauge et al. (US 3,919,395) is amended.

Regarding claim 6, the rejection under 35 U.S.C. 103(a) as being unpatentable over combined references of Hauge et al. (US 63,919,395) and Loewy et al (US 3,988,420), further in view of Dickey (<http://jove.geol.niu.edu/faculty/dickey/hcl.html>) stands as generally set forth in the final office action mailed on May 13, 2009.

Regarding claim 8, the rejection under 35 U.S.C. 103(a) as being unpatentable over Hauge et al. (US 63,919,395) further in view of Loewy et al (US 3,988,420) stands as generally set forth in the final office action mailed on May 13, 2009.

Regarding claims 12-13, the rejection under 35 U.S.C.103 (a) as being unpatentable over the references as combined (Hauge et al. and Loewy et al), further in view of Watanabe et al (US 4,113,588) stands.

### ***Previous Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious

at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3-5, 7, 9-11 and 14-15 are rejected under 35 U.S.C.103 (a) as being unpatentable over Hauge et al. (US 3,919,395).

Regarding claim 15, Hauge et al. discloses a method for recovering phosphorus compounds from both low and **high grade** phosphate ores comprising steps of:

(a) Agitating with a 2.3N hydrochloric acid solution (about 7% wt, col.3, line 33) at ambient temperature, at which stage a phosphate is digested into the solution, and the

insoluble materials (containing impurities) are then separated via a filtration (col.3, lines 52-59, claim 1).

(b) Controlling the pH with two stages of pH adjustment. Initially the pH is raised to about 1-2 with lime or ammonia, at which stage the most soluble impurities in the filtrate are precipitated and some calcium phosphates are also precipitated. At higher pH levels, greater efficiency of impurity precipitation is achieved (col3, lines 58-67).

(c) Addition of lime or ammonia to raise pH to about 3-5. Under these conditions calcium phosphate are recovered in acceptable purity (col. 3, line 67-col.4, line 4).

The apparent difference between the applicant's claim 15 and the teaching from the reference is the time for introduction of a base, whether it is added before or after a separation of initially precipitated insolubles. However, the change in sequence of neutralization and filtration would have been obvious to one of ordinary skill in the art absent evidence to the contrary. The following is a quotation of MPEP 2144.04 which forms the basis for the rejection: "In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results); In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is *prima facie* obvious.)".

Regarding claims 3-5 as discussed above, the process conditions (pH, and temperature) taught by Hauge et al. is the same as per applicant claims 3-5.

Regarding claims 7 and 10-11, Hauge et al. discloses a method of generating hydrochloric acid by treating the resulting aqueous  $\text{CaCl}_2$  solution with about stoichiometric quantity of sulfuric acid. The precipitated gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) is

recovered by filtration and the filtrate (hydrochloric acid solution) is sent to a storage tank for reuse (col. 6, lines 67 to col. 7, lines 1-7, col.8, lines 12-15, and claims 14-18).

Regarding claim 9 as discussed above, the concentration of diluted hydrochloric acid taught by Hauge et al. is 2.3 N-5 N (about 7-15% wt). The references differ from Applicant's recitation of claim 9 (<10% wt) by not disclosing identical ranges. However, the reference discloses "overlapping" ranges, and overlapping ranges have been held to establish *prima facie* obviousness (MPEP 2144.05).

Regarding claim 14, the process taught by Hauge performs either in batch fashion or continuously (col. 2, lines 57-59). A flow chart of the preferred process and a sectional view of the crystallizer used in the process equipped with a stirrer are shown in FIG. 2 and FIG. 3 (col.3, lines 33-35).

Claim 6 is rejected under 35 U.S.C.103 (a) as being unpatentable over the references as combined above (Hauge et al. and Loewy et al), further in view of Dickey et.al. (<http://jove.geol.niu.edu/faculty/dickey/hcl.html> ).

Regarding claim 6, it is well established in the field of chemistry to dilute a concentrated HCl with water to obtain a desired concentration of HCl solution (an example is given by N. Dickey for making an aqueous 10% HCl solution from a 37% HCl)

Claim 8 is rejected under 35 U.S.C.103 (a) as being unpatentable over Hauge et al. (US 63,919,395) as discussed above, further in view of Loewy et al (US 3,988,420).

As discussed above, although the process taught by Hauge is designed to recover phosphorus compounds from both low and **high grade** phosphate rock (Abstract, and col. 3, line 43-44), he does not specifically disclose an example of using the phosphate ore having 25-35%  $P_2O_5$ .

Loewy '420 teaches a combined process for the manufacture of feed grade dicalcium phosphate and pure phosphoric acid, starting with phosphate rock containing 25%  $P_2O_5$  as the recited claim 8 (Col. 6, Example 1).

It would have been obvious to one of ordinary skill in the art at the time invention was made to combine the method of Loewy with the process taught by Hauge, motivated by the fact that it reduces costs (i.e. chemical reagents, time etc) to produce an acceptable quantity and quality of product. Because both teach well known methods of recovering phosphate from phosphate ore, it would have a reasonable expectation of success. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Claims 12-13 are rejected under 35 U.S.C.103 (a) as being unpatentable over the references as combined (Hauge et al. and Loewy et al), further in view of Watanabe et al (US 4,113,588).

Regarding claims 12-13, although neither Hauge nor Loewy et al does not specifically teaches a process for purification and recovering HCl as per applicant claim 12-13 , Watanabe et al. teaches a process for recovery of waste HCl and  $H_2SO_4$  involving a base treatment (abstract and col.10, line 36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Hauge et al and Watanabe et al. to obtain the invention as specified in the claims 11-13, motivated by the fact that the process taught by Watanabe et al. for recover of HCl and H<sub>2</sub>SO<sub>4</sub> from the Fe ion enriched waste produces a high-purity iron or iron hydroxide (abstract). Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

***Allowable Subject Matter***

Newly add claim 16 is allowed.

The closest prior arts are Hauge et al. (US 3,919,395).

Hauge et al. teaches a process for extraction of phosphorus compounds from phosphate ores with an extra filtration step by compassion with the instant claim 16. The word “consisting of” transitioning from the preamble to the entire claim 16 is closed – ended, which distinct from the teachings of Hauge et al.

Neither Hauge et al. nor any prior art of records specifically teaches a process for extraction of phosphorus compounds from phosphate ores as per applicant claim 16. Therefore, the claim16 is allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

***Response to Arguments***



***With regards to the previous Grounds of Rejection***

The Remarks and a supplemental Declaration under 37 CFR 1.132 filed on March 17, 2010 is insufficient to overcome the rejection of claims 2-15 based upon rejections as set forth in the last Office action because:

Regarding claims 5 and 15, as set forth in the previous office actions, the process conditions (pH, and temperature) taught by Hauge et al. is the same as per applicant claims 2 and 5, the rejections stand.

Regarding the data submitted in the supplemental Declaration, the results from comparison experiments (i.e. rock containing 33%  $P_2O_5$ , using 10% HCl, etc) fail to demonstrate the "unexpected results" as listed in Tables 5 and 6, page 11 of Declaration Under 37 CFR 1.132:

Table 5

33% $P_2O_5$ in rock		
	Present invention	Hauge et al.
Yield (% w/w)	92.0	90.0
Impurities (F+Fe in% w/w)	0.03	0.05

And

Table 6

10% HCl		
	Present invention	Hauge et al.
Yield (%)	90.3	88.7
Impurities (F+Fe in% w/w)	0.50	0.78

In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of the critical sequence of neutralization and filtration fails to outweigh the evidence of obviousness. Therefore, the rejection with respect to claims 2-15 under 35 U.S.C.103 (a) as set forth in the last office action stands.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUN QIAN whose telephone number is (571)270-5834. The examiner can normally be reached on Monday-Thursday, 10:00am -4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YUN QIAN/  
Examiner, Art Unit 1793

May 23, 2010

/Melvin Curtis Mayes/  
Supervisory Patent Examiner, Art Unit 1793